NOVEMBER/DECEMBER 2024

23UCS21/23USC21 — DATA STRUCTURES AND ALGORITHMS

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

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1. What are called Abstract Data Types?
2. Recall the procedure to insert an element in singly linked list.
3. Tell any two applications of stack.
4. List out the operations on circular queue.
5. Define Binary tree.
6. Name the various Binary tree traversal techniques.
7. Define Graph.
8. List out the various components of Graph.
9. What is the role of Hash function?
10. What is called Open Addressing?

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) Demonstrate the procedure to array based implementation of linked list.

Or

(b) Outline the applications of Linked lists.

12. (a) Illustrate the steps in evaluating arithmetic expression using stack.

Or

(b) Compare the operations of Queue and Circular queue.

13. (a) Describe the characteristics and features of Tree data structure.

Or

(b) How will you perform insert and delete operations in binary tree? Explain with example.

14. (a) Outline the Graph data structure and its applications.

Or

(b) Illustrate Depth first traversal technique in graph.

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15. (a) Illustrate the Bubble sort algorithm and give the time complexity for the algorithm.

Or

(b) Explain the Hashing techniques with example.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Discuss on the ordered list and representation of polynomials.

17. Explain the various operations of stack with its implementation.

18. Describe the various Binary tree traversal techniques.

19. Elaborate on various types of graph.

20. Compare Linear search and Binary search technique. Explain binary search with an example.

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